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**Important scales for predicting the onset of roughness effects in the transitionally rough regime**[1] KAREN FLACK, MICHAEL SCHULTZ, U S Naval Academy — Accurately predicting the departure from hydraulically smooth behavior for a given surface has significant engineering applications including determining the frictional drag of vehicles or the pressure drop in piping systems. A series of experiments have been performed for a range of three-dimensional rough surfaces to determine the appropriate roughness scales for the prediction of the onset of roughness effects. The experiments were performed in a small water channel with a Reynolds number based on channel height range of 6,000-64,000. The wall shear stress was determined from the pressure drop in the in the channel. Scaling parameters based on the statistics of the surface topography in addition to the roughness density will be presented.

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